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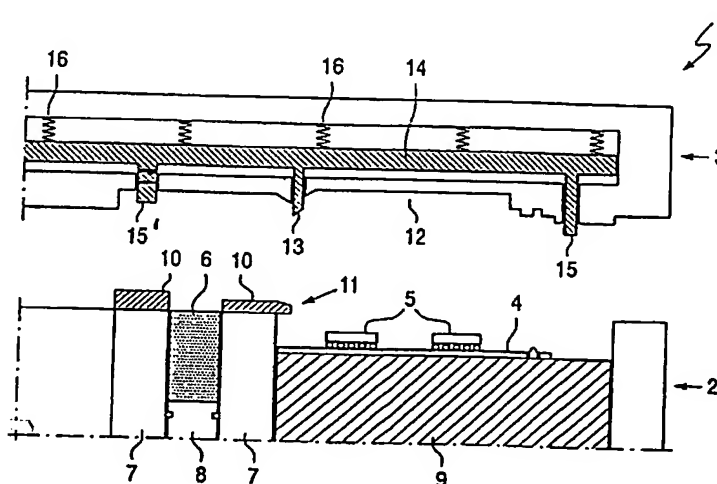
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(54) Title: DEVICE AND METHOD FOR ENCAPSULATING WITH ENCAPSULATING MATERIAL AND ELECTRONIC COMPONENT FIXED ON A CARRIER



(57) Abstract: The invention relates to a device for encapsulating with encapsulating material an electronic component, in particular a semiconductor, fixed on a carrier, comprising: two co-acting mould parts which are displaceable relative to each other between an encapsulating position, in which the mould parts, when closing onto the carrier, occupy a position for defining at least one mould cavity, and an opened position in which the mould parts are situated at a greater distance from each other than in the encapsulating position, and feed means for encapsulating material connecting onto the mould cavity. The invention also relates to a method for encapsulating with encapsulating material an electronic component fixed on a carrier.

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B. FIELDS SEARCHED

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Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 10, 30 November 1995 (1995-11-30) & JP 07 183317 A (MATSUSHITA ELECTRIC IND CO LTD), 21 July 1995 (1995-07-21) the whole document -& JP 07 183317 A (MATSUSHITA ELECTRIC IND CO LTD) 21 July 1995 (1995-07-21)	1-17
X	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 11, 26 December 1995 (1995-12-26) & JP 07 205214 A (PACK VISION:KK), 8 August 1995 (1995-08-08) the whole document -& JP 07 205214 A (PACK VISION:KK) 8 August 1995 (1995-08-08) ----- -/--	1-17

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☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 01/17012 A (VERMEULEN RICHARD THEODORUS ; FICO BV (NL); PETERS HENDRIKUS JOHANNES) 8 March 2001 (2001-03-08) the whole document	1-17
Y	EP 0 726 598 A (FICO BV) 14 August 1996 (1996-08-14) the whole document	1-17
A	PATENT ABSTRACTS OF JAPAN vol. 0164, no. 99 (E-1280), 15 October 1992 (1992-10-15) & JP 04 184944 A (CITIZEN WATCH CO LTD), 1 July 1992 (1992-07-01) -& JP 04 184944 A (CITIZEN WATCH CO LTD) 1 July 1992 (1992-07-01) the whole document	
A	PATENT ABSTRACTS OF JAPAN vol. 0062, no. 26 (E-141), 11 November 1982 (1982-11-11) & JP 57 128930 A (YAMAGATA NIPPON DENKI KK), 10 August 1982 (1982-08-10) -& JP 57 128930 A (YAMAGATA NIPPON DENKI KK) 10 August 1982 (1982-08-10) the whole document	
A	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 06, 31 July 1995 (1995-07-31) & JP 07 080895 A (OLYMPUS OPTICAL CO LTD), 28 March 1995 (1995-03-28) abstract	

INTERNATIONAL SEARCH REPORT

Information on patent family members

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PCT/NL2004/000005

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 07183317	A	21-07-1995	US 5779958 A	14-07-1998
JP 7183317	A	21-07-1995	US 5779958 A	14-07-1998
JP 07205214	A	08-08-1995	NONE	
JP 7205214	A	08-08-1995	NONE	
WO 0117012	A	08-03-2001	NL 1012488 C2	03-01-2001
			EP 1259981 A1	27-11-2002
			JP 2003508911 T	04-03-2003
			WO 0117012 A1	08-03-2001
			TW 421868 B	11-02-2001
EP 0726598	A	14-08-1996	NL 9500238 A	02-09-1996
			CN 1137441 A	11-12-1996
			DE 69632095 D1	13-05-2004
			DE 69632095 T2	14-04-2005
			EP 0726598 A1	14-08-1996
			HK 1014081 A1	15-10-2004
			JP 3221827 B2	22-10-2001
			JP 8276461 A	22-10-1996
			SG 42885 A1	17-10-1997
			US 6019588 A	01-02-2000
			US 5766650 A	16-06-1998
JP 04184944	A	01-07-1992	JP 2977889 B2	15-11-1999
JP 4184944	A	01-07-1992	JP 2977889 B2	15-11-1999
JP 57128930	A	10-08-1982	JP 1379301 C	28-05-1987
			JP 61046049 B	11-10-1986
JP 07080895	A	28-03-1995	NONE	